

# Use Case How To

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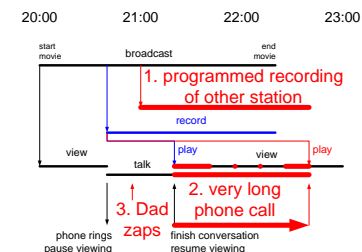
## Abstract

Use cases are frequently used in Software Engineering. Use cases support specification and facilitate design, analysis, verification and testing. Many designers, unfortunately, apply use cases in a rather limited way. This presentation provides recommendations for effective use cases.

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# Why Use Cases?

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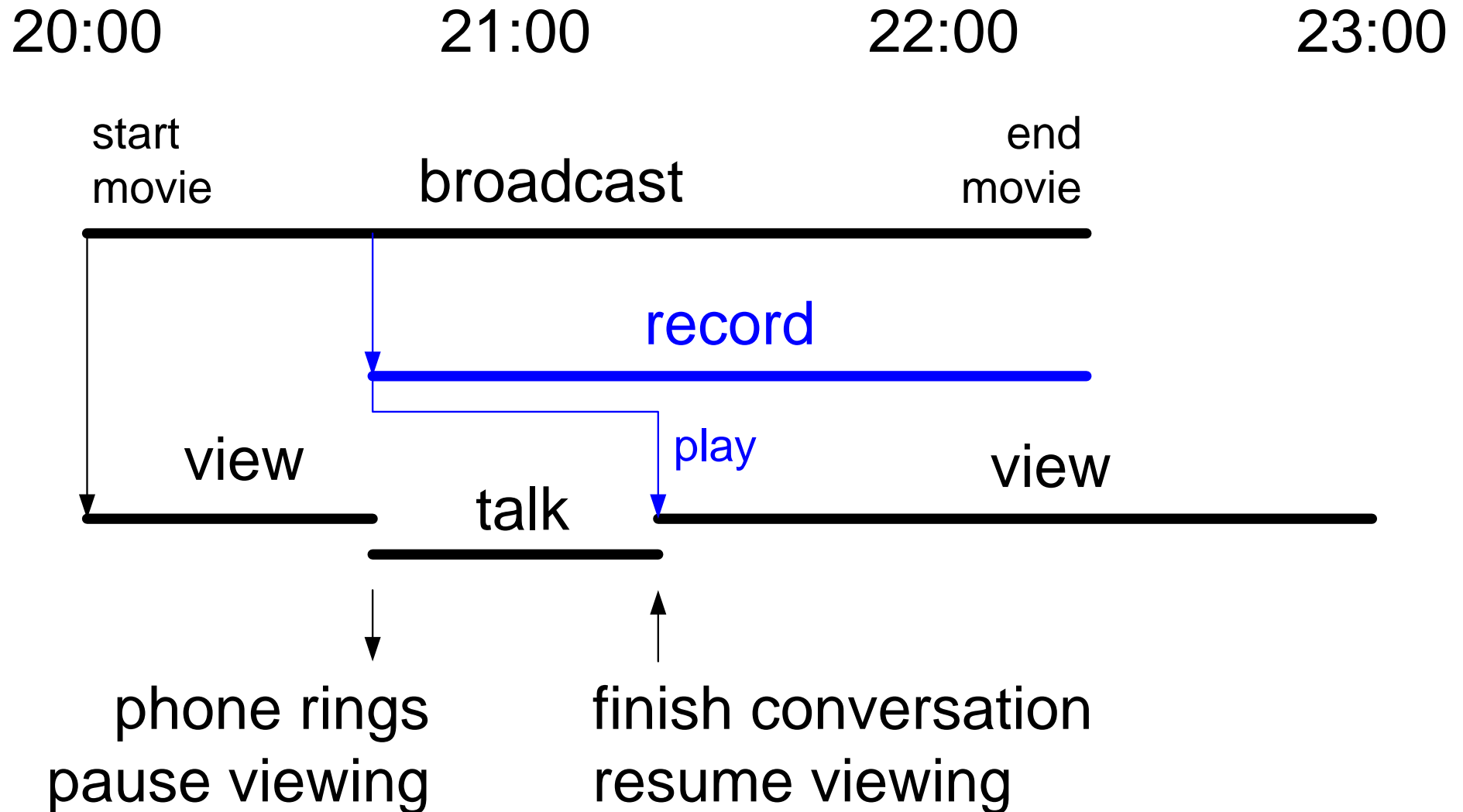
Supports or is part of specification

by providing specific data in user perspective

Facilitates analysis and design

Facilitates verification and testing

# Example Time Shift recording



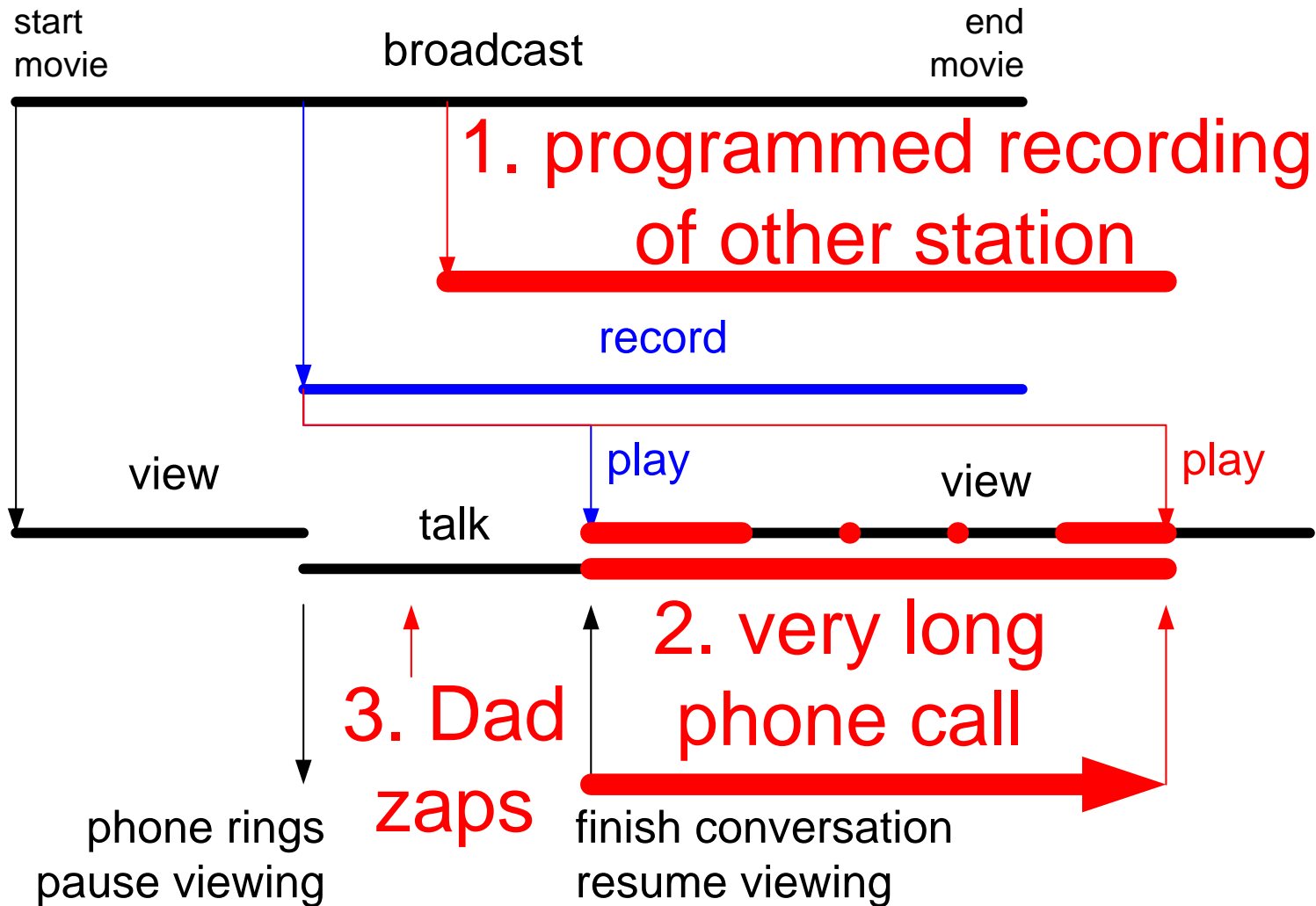
# Construction limits intrude in User Experience

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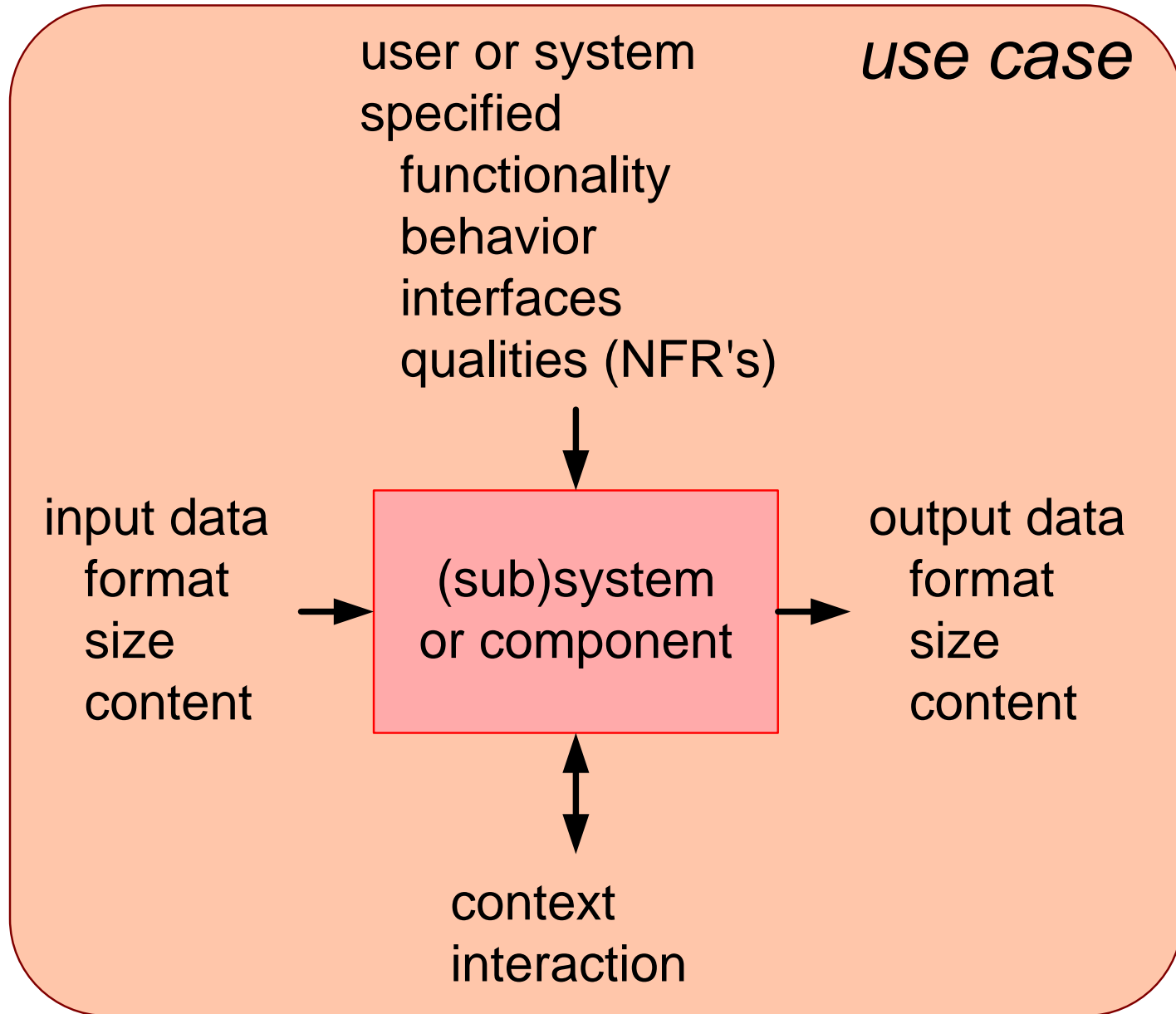
- number of tuners
- number of simultaneous streams (recording and playing)
- amount of available storage
- management strategy of storage space

# What if?

20:00                      21:00                      22:00                      23:00



# Content of a Use Case



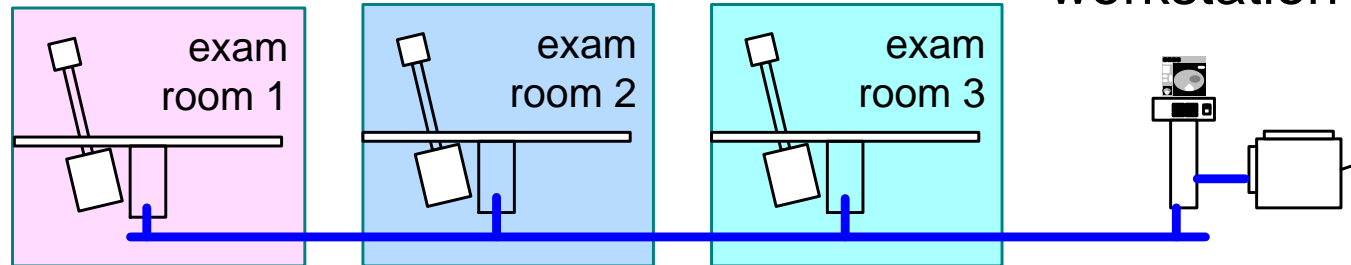
# Example personal video recorder use case contents

typical use case(s)	worst case, exceptional, or change use case(s)
<p><b>interaction flow (functional aspects)</b></p> <ul style="list-style-type: none"><li>select movie via directory</li><li>start movie</li><li>be able to pause or stop</li><li>be able to skip forward or backward</li><li>set recording quality</li></ul>	<p><b>functional</b></p> <ul style="list-style-type: none"><li>multiple inputs at the same time</li><li>extreme long movie</li><li>directory behaviour in case of</li><li>extreme many short movies</li></ul>
<p><b>performance and other qualities (non-functional aspects)</b></p> <ul style="list-style-type: none"><li>response times for start / stop</li><li>response times for directory browsing</li><li>end-of-movie behaviour</li><li>relation recording quality and storage</li></ul>	<p><b>non-functional</b></p> <ul style="list-style-type: none"><li>response time with multiple inputs</li><li>image quality with multiple inputs</li><li>insufficient free space</li><li>response time with many directory entries</li><li>replay quality while HQ recording</li></ul>

# Example of Quantification of Typical Use Case

3 examination rooms connected to

1 medical imaging workstation + printer

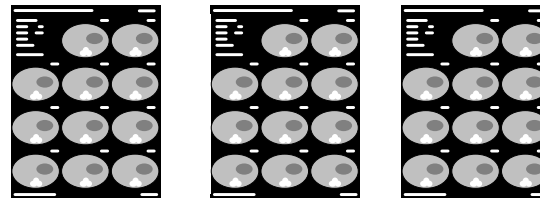


examination room: average 4 interleaved examinations / hour

image production: 20  $1024^2$  8 bit images per examination



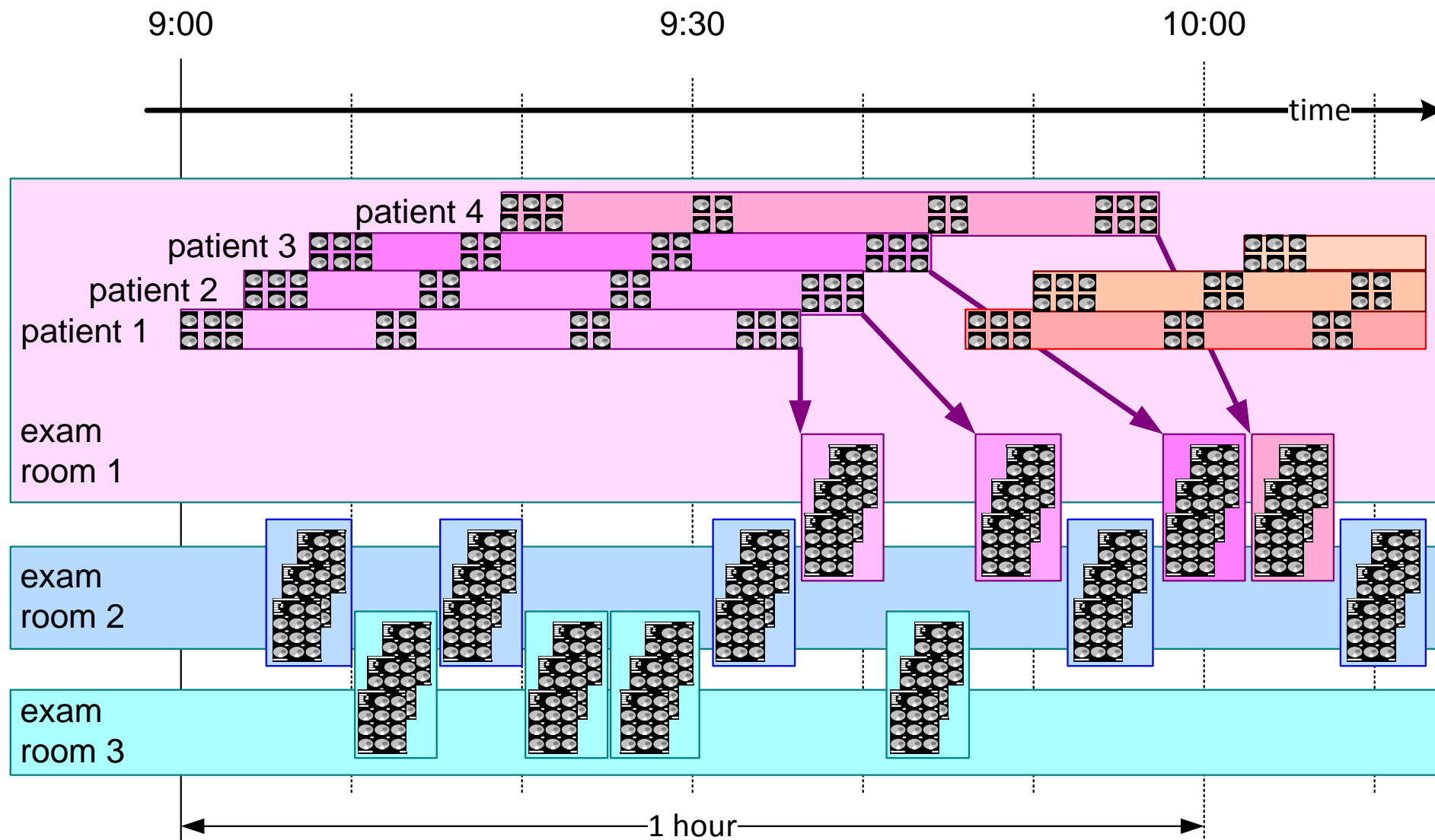
film production: 3 films of 4k\*5k pixels each



high quality output  
(bi-cubic interpolation)



# Timing of this Use Case



# Recommendations for working with use cases

- + combine related functions in one use case
- do not make a separate use case for every function
- + include non-functional requirements in the use cases
  
- + minimise the amount of required *worst case* and *exceptional use cases*
- excessive amounts of use cases propagate to excessive implementation efforts
- + reduce the amount of these use cases in steps
- a few well chosen *worst case* use cases simplifies the design